

The invention claimed is:

1. A process for constructing load-bearing structures incorporating drilling cuttings, said process comprising operations of:

(1) forming a particulate mixture comprising drilling cuttings; and

5 (2) at least one of groups (2.1) and (2.2) of suboperations, said group (2.1) comprising suboperations of:

(2.1.1) mixing said particulate mixture comprising drilling cuttings in a specified proportion with at least one stabilizer selected from the group consisting of:

- 10 (A) quicklime;
(B) hydrated lime;
(C) Portland Cement;
(D) Class C fly ash;
(E) cement kiln dust;
(F) lime kiln dust;
15 (G) Class F fly ash; and
(H) other pozzolans

to form a cementitious second mixture;

(2.1.2) forming said cementitious second mixture into the shape and size of the desired load-bearing structure; and

20 (2.1.3) causing the shaped and sized second mixture formed in suboperation (2.1.2) to undergo a pozzolanic reaction to form said load-bearing structure;

and said group (2.2) comprising suboperations of:

(2.2.1) mixing said particulate mixture comprising drilling cuttings in a specified proportion with at least one of foamed asphalt and emulsified asphalt to form
25 an asphaltic second mixture;

(2.2.2) forming said asphaltic second mixture into the shape and size of the desired load-bearing structure; and

30 (2.2.3) causing the shaped and sized asphaltic second mixture formed in suboperation (2.2.2) to form the load-bearing structure by removal from said shaped asphaltic second mixture of a sufficient fraction of the gas dispersed in any foamed asphalt incorporated into said second mixture and of the liquid continuous phase in which any emulsified asphalt incorporated into

said shaped second mixture is emulsified.

2. A process according to claim 1, wherein at least 10 percent by mass of said particulate mixture are deep drilling cuttings that have been generated by a process comprising the following suboperations:

- 5 (1.1) providing drilling means, drilling driving means that cause the drilling means to operate at the bottom of a borehole, and drilling mud; and
- (1.2) causing said drilling driving means to drive said drilling means while said drilling mud flows into and out of said borehole through separate passage-ways disposed so as to insure that mud pumped into the borehole must reach the near vicinity of the drilling means that is deepening, widening, and/or otherwise increasing the volume of said borehole before the mud can enter any passageway through which a mixture of mud and cuttings flows out of the borehole during drilling, said mixture of mud and cuttings, option-ally after removal therefrom of all or part of the constituents of said mixture that are not cuttings, constituting said deep drilling cuttings.
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3. A process according to claim 2, wherein at least part of the deep drilling cuttings have been produced by drilling with a water-based drilling mud.

4. A process according to claim 3, said process comprising group (2.1) of suboperations.

20 5. A process according to claim 4, wherein said stabilizer is selected from the group consisting of quicklime, hydrated lime, Portland Cement, Class C fly ash, and mixtures of Class C fly ash with Portland Cement.

6. A process according to claim 5, wherein:

said stabilizer is a mixture of Class C fly ash with Portland Cement; and

25 suboperation (2.1.1) is accomplished in two stages, in the first of which Class C fly ash is mixed with said particulate mixture comprising drilling cuttings and in the second of which Portland Cement is mixed into the mixture previously formed by mixing Class C fly ash with said particulate mixture comprising drilling cuttings.

30 7. A process according to claim 6, wherein, based on the particulate mixture comprising drilling cuttings to be stabilized:

the amount of Portland Cement used as a stabilizer is at least 1.0 %;

the amount of Class C fly ash used as a stabilizer is at least 2.0 %; and

the ratio of the amount of Class C fly ash used as a stabilizer to the amount of Portland Cement used as a stabilizer is at least 0.50:1.0 but is not more than 10:1.0.

8. A process according to claim 2, wherein at least part of the deep drilling cuttings have been produced by drilling with an oil-based drilling mud.

5 9. A process according to claim 8, said process comprising group (2.1) of suboperations.

10. A process according to claim 9, wherein said stabilizer is selected from the group consisting of quicklime, hydrated lime, Portland Cement, Class C fly ash, fluidized bed fly ash, and mixtures of either Class C or fluidized bed fly ash with Portland Cement.

10 11. A process according to claim 10, wherein:

- said stabilizer is a mixture of Class C or fluidized bed fly ash with Portland Cement; and
- suboperation (2.1.1) is accomplished in two stages, in the first of which C fly ash is mixed with said particulate mixture comprising drilling cuttings and in the second of which Portland Cement is mixed into the mixture previously formed by mixing fly ash with said particulate mixture comprising drilling cuttings.

12. A process according to claim 11, wherein said load-bearing structure has an unconfined compressive strength of at least 100 psi and has a thickness of:

- at least 8 inches if constructed on a subgrade with a resilient modulus that is at least 15.0 kpsi;
- at least 12 inches if constructed on a subgrade with a resilient modulus that is at least 10.0 kpsi but less than 15.0 kpsi; and,
- at least 16 inches if constructed on a subgrade with a resilient modulus that is at least 5.0 kpsi but less than 10.0 kpsi.

13. A process according to claim 10, wherein said load-bearing structure has an unconfined compressive strength of at least 100 psi and has a thickness of:

- at least 8 inches if constructed on a subgrade with a resilient modulus that is at least 15.0 kpsi;
- at least 12 inches if constructed on a subgrade with a resilient modulus that is at least 10.0 kpsi but less than 15.0 kpsi; and,
- at least 16 inches if constructed on a subgrade with a resilient modulus that is at least 5.0 kpsi but less than 10.0 kpsi.

14. A process according to claim 7, wherein said load-bearing structure has an unconfined compressive strength of at least 100 psi and has a thickness of:
- at least 8 inches if constructed on a subgrade with a resilient modulus that is at least 15.0 kpsi;
 - 5 - at least 12 inches if constructed on a subgrade with a resilient modulus that is at least 10.0 kpsi but less than 15.0 kpsi; and,
 - at least 16 inches if constructed on a subgrade with a resilient modulus that is at least 5.0 kpsi but less than 10.0 kpsi.
15. A process according to claim 6, wherein said load-bearing structure has an unconfined compressive strength of at least 100 psi and has a thickness of:
- at least 8 inches if constructed on a subgrade with a resilient modulus that is at least 15.0 kpsi;
 - at least 12 inches if constructed on a subgrade with a resilient modulus that is at least 10.0 kpsi but less than 15.0 kpsi; and,
 - 15 - at least 16 inches if constructed on a subgrade with a resilient modulus that is at least 5.0 kpsi but less than 10.0 kpsi.
16. A process according to claim 5, wherein said load-bearing structure has an unconfined compressive strength of at least 100 psi and has a thickness of:
- at least 8 inches if constructed on a subgrade with a resilient modulus that is at least 15.0 kpsi;
 - 20 - at least 12 inches if constructed on a subgrade with a resilient modulus that is at least 10.0 kpsi but less than 15.0 kpsi; and,
 - at least 16 inches if constructed on a subgrade with a resilient modulus that is at least 5.0 kpsi but less than 10.0 kpsi.
- 25 17. A process according to claim 4, wherein said load-bearing structure has an unconfined compressive strength of at least 100 psi and has a thickness of:
- at least 8 inches if constructed on a subgrade with a resilient modulus that is at least 15.0 kpsi;
 - at least 12 inches if constructed on a subgrade with a resilient modulus that is at least 10.0 kpsi but less than 15.0 kpsi; and,
 - 30 - at least 16 inches if constructed on a subgrade with a resilient modulus that is at least 5.0 kpsi but less than 10.0 kpsi.

18. A process according to claim 3, wherein said load-bearing structure has an unconfined compressive strength of at least 100 psi and has a thickness of:
- at least 8 inches if constructed on a subgrade with a resilient modulus that is at least 15.0 kpsi;
 - 5 - at least 12 inches if constructed on a subgrade with a resilient modulus that is at least 10.0 kpsi but less than 15.0 kpsi; and,
 - at least 16 inches if constructed on a subgrade with a resilient modulus that is at least 5.0 kpsi but less than 10.0 kpsi.
19. A process according to claim 2, wherein said load-bearing structure has an unconfined compressive strength of at least 100 psi and has a thickness of:
- at least 8 inches if constructed on a subgrade with a resilient modulus that is at least 15.0 kpsi;
 - at least 12 inches if constructed on a subgrade with a resilient modulus that is at least 10.0 kpsi but less than 15.0 kpsi; and,
 - 15 - at least 16 inches if constructed on a subgrade with a resilient modulus that is at least 5.0 kpsi but less than 10.0 kpsi.
20. A process according to claim 1, wherein said load-bearing structure has an unconfined compressive strength of at least 100 psi and has a thickness of:
- at least 8 inches if constructed on a subgrade with a resilient modulus that is at least 15.0 kpsi;
 - 20 - at least 12 inches if constructed on a subgrade with a resilient modulus that is at least 10.0 kpsi but less than 15.0 kpsi; and,
 - at least 16 inches if constructed on a subgrade with a resilient modulus that is at least 5.0 kpsi but less than 10.0 kpsi.

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